ENGINEERING NEWS

26746

AND

AMERICAN CONTRACT JOURNAL.

VOLUME XIV.

JULY TO DECEMBER,

1885.

ENGINEERING NEWS PUBLISHING CO.

NEW YORK.

GENERAL LIBRARY OF THE UNIVERSITY OF ILLINOIS

INDEX TO VOLUME XIV.

A.

A B C Process, Aylesbury, Eng 49
Absorbency of Walls 182
Accidents on the New Croton Aqueduct 377
Adjustable Stand for Maps 103
Advertising and its Relation to Commerce 387
Advertising, Unprofitable 39
Advertising, When Wanted 58
Air-gun 107
Air in Long Pipes, Co-efficient of Friction in 21
Air-pump 97
Air Required in the Ventilation of Buildings 411
Air Space in Stables 87
Almanac, How made 107
Am. Asso. at Ann Arbor 184
American vs. English Railway Practice 290, 370
Aqueduct, An Ancient 387
Aqueduct, Liverpool, Eng 190
Aqueduct, New Croton 27, 78, 95, 142, 394
Architecture, Bill Nye on Modern 103
Architectural Dates 53
Architectural Schools Necessary 41
Are Engineering Contract 321
Armor Plate, Guns and 400
Armor-belt, McIntyre's 152
Artesian Wells (*see Wells*)
Asphalte, Effect on Workmen of 47
Asphalte, Indian 242

Associations.

American Society of Civil Engineers, 8, 11, 12, 151, 167, 234, 266, 289, 331, 362
Boston Society of Civil Engineers 361
Cleveland Convention 341, 346, 381
Connecticut Society of Civil Engineers and Surveyors 187
Engineers Club, Philadelphia, 12, 299, 331, 362, 395
French Society of Civil Engineers 312
Illinois Engineers and Surveyors 346
Liverpool Engineering Society 26, 366
Michigan Engineering Society 346
Engineering Society; Nebraska Association 57
Rhode Island Institute of Architects 411
St. Louis Engineers Club 346, 381
Western Soc. C. E. 372

Atlantic Coast, U. S. scheme to change the Climate of 312
Automatic Freight Car Brakes 280
Autumn Day's Excursion 200
Axles, Breakages of, on German Railroads 283

B.

Baggage Rates, English 94
Bartholdi Statue, Cost of 99
Bidders, Unfairness to 57
Bids. Brick drains, Norwich, Conn 1 6
Brickwork, Louisville, Ky 3 9
Bridge, Minneapolis 415
Bridges, Chillicothe, O 301
Bridges, Cleveland, O 110
Bridges, New York 366
Bridges, Springfield, O 240
Buildings, Madison, Wis 191
Buildings, Pittsburgh, Pa 33
Cement, Boston, Mass 125
Coal, Philadelphia 210
Dike on Delaware River 78
Dikes, New Baltimore, N. Y 272
Dredging, Bangor, Me 218
Dredging, Flood Rock 270
Dredging, Hudson River 222
Dredging, Okeechobee, Fla 222
Dredging, Philadelphia, Pa 63
Engine House, Boston 126
For the New Cruisers 63
Gate House, Croton Aqueduct 95
Government Works 175
Grading, Indianapolis, Ind 143
Granite and Brickwork, Pittsburgh 78
Granite Block, New Haven 239
Ice-pier, Newport, Ky 208
Illinois State House 190
Iron Roof, Pensacola 143
Iron Roof, Syracuse, N. Y 319
Iron Work 126
Jail, Little Rock, Ark 239
Laying Water-main, Minneapolis 95
Levee Work 208
Library, Dayton, O 208
Lima, O., Water Works 14
Med. Museum, Washington 126
Minerva, O., Water Works 269
New Croton Aqueduct, Sec. 1 93
Paving, Albany, N. Y 206
Paving-blocks, Gloucester, Mass 111
Paving, Chicago 415
Paving, Cincinnati, O 366
Paving, Fifth Ave., N. Y 63, 189
Paving, Minneapolis 1.6
Paving, New York 78
Paving, Pittsburgh, Pa 175
Paving, St. Paul, Minn 111
Paving, Toronto, Can 1.5
Paving, Winnepeg 175
Pipe, Detroit 398
Pipe, Minneapolis 381
Pipe, Nashville, Tenn 234
Pipe, Wilmington, Del 221
Pipe Laying, Minneapolis 125
Pipe Laying, etc., Nashville, Tenn 61
R. R. Grading, Jackson, Tenn 239
Reservoir, Fisher Hill, Boston 221, 239
Rip-rap, Nantucket 270
Rolling Draw Span 399
Sewers, Allegheny City 222
Sewers, Baltimore 111, 319
Sewer, Binghamton, N. Y 111, 175
Sewer and Paving, Buffalo 159
Sewers, Columbus, O 256
Sewer, Dayton, O 175
Sewers, Hartford, Conn 286
Sewers, Lynn, Mass 143
Steam Heating, Worcester, Mass 319
Street Grading, Lancaster, Pa 78
Street Sweeping, St. Louis 175
Texas, Trunk R. R 415
Town House, Hartford, Conn 319
Troy, Bridge 305
Unbalanced in N. Y 380 399
Water-pipe, Troy, N. Y 270
Water Works, Springfield, O 173
Bi-sulphide of Carbon for Steam 97
Blue Prints, Reverse 107
Boiler, the Largest Locomotive 158
Bolts and Screw Threads, Experiments 242
Bore-hole, The "Deepest," 111
Borrow-pit Excavation 341
Box Culverts, Maximum Spans 55
Brazil, Railroad Depression in 311
Breakwater, Lincoln Park 222
Brick, Clinker 246
Brick Pavements for Streets 330

Bridge, Alamosa, Col 95
Alpena, Mich 207 415
B. and O., over Schuylkill 159, 286
B. and O., at Wilmington 110
Big Moody, Neb 254
Davenport, Ia 93
First Wire Suspension in U. S 40
Florence 126
Forth 234, 283, 343
Forth, Hydraulic Appliances on 313
Fullerton, Neb 95
Galena, Ill 239
Glasgow, Mo 94, 136
Harlem, Comm 63, 255
Henderson 104
Inspection, N. Y. State 63
Havre de Grace, Md 271
Keithburg 393
Kentucky and Indiana 94, 271, 334
King Co 30, 95
Lachine 158, 303, 317
Lehigh Suspension 31
Milwaukee 222
Minneapolis 30
Morse Co 110
Mountain Creek 194
Nashville 158
New Haven, Conn 255
New Mississippi 238
Newport and Covington 159, 240
Omaha, Neb 223, 303
Pt. Pleasant, W. Va 254, 335
Proposed Cincinnati 318
Proposed Memphis, Tenn 239
Quinnipiac 158
Rulo, Neb 351
Saginaw River 415
Salinas, Cal 318
Seventh Street, St. Paul, Minn 246
Shroeppel, N. Y 222
St. John's Cantilever 47, 107
St. Lawrence 367
St. Lawrence, Specifications 226
Storm King 223, 309, 351, 379
Sukkur, Over the Indus 403
Suspension Across Mississippi River 367
Tay 66 399
Tay, Floating Out of the First Large Girders 414
Tay, Inspection of 317
Tilted Caisson at the Forth 343
Tulsa, I. T 223
200 feet high on Can. Pacific 47
Union Co 110, 223
White River 110
Williamsport, Pa 111
Westport, Conn 234
Windsor Locks 207
Winona, Minn 222
Works, the Berlin 191
Bridges, Chicago 415
Bridges, C. B. & N. R. R 351
Bridges, Dangerous R. R 377
Bridges, English *vs.* American, in Japan 216
Bridges, Iron Substructure for R. R 373
Bridges, Market St 122
Bridges, Piers of Ancient 84
Bridges, Wernwag 99
Bridges, American in English Colonies 345
British Pounds 281
Brooklyn, Growth of 309
Building Project 382
Bureau of Public Works, Wanted 361
Business Honor 45

C.

Cable Company, New 415
Cable Road, Brooklyn 47
Cable Road, St. Louis 79, 3 2
Cable Roads, New York 174
Cable R. R's. Proposed 126
Cable Transportation at the Jalia Mines France 281
Cabs, Iron Locomotive 111
Calculation, Rapidity of, etc 308
Campanile of St. Mark's, Foundations under 152
Canadian News 413

Canal. Apopka 350
Baltic and North Sea 409
Baltic Ship 47, 175
Cape Cod 383
Catlin, Col., Irrigating 31
Corinth 40
Lake Erie & Ohio River 416
Manchester Ship 93
Maryland Ship 126
The Moselle 318
Nicaragua 335
Palestine 287
Panama 40, 89, 120, 191, 266, 287, 303, 326 394
Projects, European 336
Pusheta Irrigating 46
Suez 24, 185
Sues, A Pope who Thought of a 415
Sues, and Intended Improvement 194
Welland, Enlargment 271
Welland, Removing Rock in 17
Work in Canada 239
Canals as Freight Regulators 360
Canals, Florida 415
Car, Hopper Gondola 192
Car-load, A Standard 178
Carpenter's Work, Specifications of 129
Cars, on Transcontinental lines 318
Casting and Fusing Process, Advance in 107
Cellulose, Cocoanut 90

Cement. Chemical Test called for 363
Cements, Chemical Test of 412
Cement, Effect of Sand on 22
Cement Tests, Boston 1
Cement Testing 199
Cement, Report of the Committee on a Uniform System for Tests of 388
Cement, Tests of 412
Cements, Report of E. G. De Smedt 364 395
Cements, The "Porte de France," 294
Chaining, Accurate 177, 220
Channel, Delaware 414
Chili's R. R. Debt 206

Chimney Construction 52, 113, 166, 273, 305
Chimney, Highest 306
Chimney, Merrimac Co., Lowell, Mass 35
Chimney, Moving a 18
Chimney, N. Y. Steam Heating Co 37
Chimney, Pacific Mills, Lawrence, Mass 35
Chimney, Tall, Construction 406
China, Contractors Experience in 241
China, Railroads in 315
Chinese Affairs 345
Cholera-germ Destroyer 173
Cities, Government of 404
City, the Largest in the World 165
City Travel, the Growth of in N. Y 308
Civil Engineers in the South 171
Civil Engineers on Gov't Works 298
Civil Eng. Soc's. in U. S., List of 25
Civil Service Examinations 58
Civil Service in Ireland 232
Clocks, Dials of Public 182
Coal-dust Explosions 107
Coal in Illinois 409
Coal Mines, Illinois 391
Coal Shaft, Sinking a 97
Coast Defences, Our 393
Coast Survey, Investigation of 185
Cocks, Asbestos—packed 348
Coke for Steam Making 63
Company, Florence Land and Canal 394
Compressed-air Motor, New 56
Concrete Breakwater, Newhaven, Eng 56
Concrete, to Make 97
Coney Island, Sanitary Condition 178, 210
Contract Case, An English 161
Contract Prices in France 90
Contract, Steel 399
Contractors Exchange 362
Contractors, Suits with 362
Contracts, Can. Pac. R. R 351
Contracts, St. Paul, Minn 159
Cordage, Preservation of 313
Cost of Manufactures and the Administration of Workshops, Public and Private 412
Cross-ties, Durability of 189
Croton Aqueduct 389

D.

Dam. Across the Potomac 123
Dam, Davis Island 210
Dam, Repairing Holyoke 206
Dangerous R. R. Bridges 376
Dangerous Structures 199
Deacon Waste Meter 178
Death-rate, Actual, in War 97
Debt of Great Britain 47
Defences, Our Coast 303
De Lorme and Chinese Railroads 338
Derrick, A Large 272
Distance-measurer, A New 245
Diving Bell 65
Dock, A Substantial New 414
Docks, Washburn, Wis 159
Draft, A, On the Czar 416

Drainage. Boston Main 203
Drainage Enterprise, a Remarkable 404
Drainage in Illinois 274, 286, 298, 391, 414
Drainage, Proposed London 38
Drainage Regulations, Glasgow 81
Draining Jersey Meadows 349
Drains, Ordinance relating to Private 106
Draw-span, A Long 192
Dredger, A Novel 265
Dredging, A New Process of 63
Drilling Power on the South Penn. R. R. Tunnels 393, 394
Drills at the Inventions Ex., Rock 373
Drills, The Rand Co 96
Dry Dock, Halifax 222
Dry Dock, League Island, Pa 238
Dyking, Best Material for 284

E.

Earth. Temperature of 350
Earthwork, Notes on 114
Egyptian Obelisk in Central Park 296
Electric Bell Rope 350
Electric Light Companies 176
Electric Lighting in Mines 57
Electric Light in Denver 381
Electrical Units 187
Electricity Applied to a Calculating Machine 169
Electricity, Extracting Metals by 220
Elevated R. R. Brooklyn 61, 159
Elevated R. R. in Paris 63
Elevated R. R. Jersey City 159
Elevator, A Safe 47
Elevator, Testing the Hodge 43
Engineering Advice, Value of 11
Engineering as a Profession 131

Engineering Societies in U. S. List of Civil 25
Engineering, The Iron Trade and the Future of 392
English R. R's. and Streets 287
Eruption at Krakatoa 394
Examinations, Competitive 27
Exhibition, London-American 23, 344
Exhibition, Rome, 1885 84
Experiments, Result of Interesting 397

Explosive, A New 225
Explosive, A New Swedish 47
Explosive Experiments at Lydd, Eng 225
Explosion, Hallet's Pt 376
Explosion, Flood Rock 248, 340, 272
Explosions of Carbon Dust 299
Explosions, Submarine 278

F.

Fast Trains, Weight of 94
Filtering Gallery, Columbus, O 253
Fire-damp, Accidents from 145
Fire-damp in Mines 133
Floating Landings 84
Flood Rock 47, 102, 280, 282 399
Flood Rock, Dredging at 264
Flood Rock Explosion 249, 248, 272
Flood Rock Transmission of Shock 264
Fluctuations in Lake Michigan 121
Forestry Chart 272
Forestry in Europe 39
Foundations, Deep 42
Freezing Process in U. S 11
Freight Car, Cost of 206
Freight Trains, Long 394
Frogs, Adjusting 58
Fuel of Lake Steamers 7

G.

Galvanometer, the Largest 47
Garbage Remover, Brooklyn 206
Gas for Passenger Cars 127
Gas in Illinois, Natural 379
Gauge, Change of in South 387
Gauge, Cost of Changing 336
Geological Survey of Alabama and Georgia 91
Geol. Survey of Louisiana 336
Geol. Survey of Michigan 336
Geological Survey, Report of U. S 309
Girders, Wrought Iron 129
Glass, Tempered 49
Glue to Resist Heat 26
Grading in Mexico 351
Granite, Aberdeen 199
Granite, Strength of 387
Grant, Gen. U. S. as an Engineer 167
Grant's Monument 123
Great Eastern Sold 303
Gun, Factory, A Great 414
Gun, The New, of Col. de Bange 57

Gun. Trial of the Elswick 234
Guns and Armor Plate 400
Guns, The Great, of the Day 122
Guns, What it Costs to Make 324
Guns, Wire Siege 105
Gutters 209

H.

Hard Times, Swinton's Cure for 245
Hay Stacks 203
Headings, Driving, without Explosives 161
Hell Gate, Gov. Impts. at 162
Holland Dykes 78
Horses vs. Asphalte Pavement 256
Hudson Bay, To Europe, by Way of 313
Hydrants, Thawing Frozen 400
Hydrographic Work of the Navy 335

I.

Iceberg Dust 218
Ice, Strength of 407
Illinois and Indiana News 414
Illumination Purposes, Is Oil, Gas, or Electricity the best for 406
Inclined Plane in Pittsburgh 192
Incrustations in Water-pipe, Removal by Acids 109

Index Periodical Literature. 16, 32, ... 48, 64, 80, 96, 112, 128, 144, 160, 176, 208 224
India Rubber, A substitute for 246
Indo-European Telegraph 284
Industrial Situation 185
Industries, Among the 304
Inflammability of Timber 300
Ink, Copying 7
International Institute 299
Interoceanic Problem 138
Iron Beam, The Largest 63
Iron-clad, New Italian 135
Iron Paint 0
Iron Trade and the Future of Engineering, The 392
Irrigation Ditch, Merced 159
Irrigation Ditch, Wyoming 142
Irrigation in Colorado 238
Irrigation, San Antonio, Tex 93
Irrigation Scheme in Mexico 302
Irrigation Syphon, Automatic 164
Irrigation Works, El Paso 173
Island in the Pacific, New 373

J.

Jail, An Iron Cylinder 234
Japanese Technical Apparatus 59
Jetties, South Pass 79, 96

K.

Knots for Engineers 402
Krupp, Progress of his Works 285

L.

Labor in the Northwest 255
Labor Prices, Northwestern 244
Land-grant Roads, Rules for 361
Land Grants, Forfeited in Mexico 63
Landings, Floating 84
Leather, Durability of 7
Light-house, Foundation of, on 14 feet Shoal 275
Lightning, Increase of Danger from 299
Liquid Fuel in California 266

Literature. Index to Periodical, 16 32, 48, ... 64, 80, 96, 112, 128, 144, 160, 176, 208. 224
Elements of Railroading 44
Windmill as a Prime Mover 44
Topographical Surveying 44
Topographical Drawing 91
Select Plans of Engineering Structures 106
Trade Publications 106
American Engineering Register 139
Main Drainage Works of Boston 139
Transactions, Am. Soc. C. E 139, 154, ... 187, 346, 412
Proceedings Fifth Annual Meeting, Am. Water Works Asso 139
Modern Moulding and Pattern Making 139
Memoirs of University of Tokio 154
Preservation of Timber by Antiseptics 171
Guide to Sanitary House Inspection 171
Adjustment of Observations, etc 171
Water Meters 172
Practical Estimator 172
Steam Engine Catechism 187
Proceedings Engineer's Club of Phila 187
Proceedings of the Michigan Eng. So 412
Straight Tips 252
West's Moulder's Text Book 252
Sanitary Survey of St. Louis 252
Story of the Heavens 252
Notes on Chemistry of Iron 267
Lectures on the Principles of House Drainage 267
Architectural Studies 267
The Panama Canal 326
New Atlas of New York City 327
Journal of the Asso. Engineering Societies 346, 390,
Magazine of Art 346
Annual Report of the Chief of Engineers 347
Report of U. S. Geological Survey 347
Report on Machine Tools and Wood Working Machinery 390

Locomotive Endurance 61
Locomotive, First in N. Y 45
Locomotive, Smallest in U. S 15
Locomotives *vs.* Mosquitoes 47
Locomotives, American, in New Zealand 152
Locomotives, Export of 313, 329
Locomotives for New Zealand 360
Locomotives, Work of 223
London, Growth of 97
London Water 105

M.

Machines, Topography of 53
Magnetic Survey of Scotland 325
Masonry Arch, Lifting a 73
Masonry, French 305
Masonry, Liebhaber Process for Cleansing 201
Material Welfare, Progress in 161
Mathematical Column 23, 119, 151, 218, 595, 287
Mechanical Arts, European, in Asia 403
Metal, a New 135
Metric Catechism 41
Metric Measures and Civil Engineers 26
Metric System Rebuked 76
Metropolitan Railway of Paris 105
Mexico and India 7
Mexico, Railroad Building in 89
Mexico, Railway Situation in 86
Mexico, to Drain the Valley of 336
Mining Debris in California 222

Mines, Illinois Coal 381
Mines, Electric Light in 57
Monkeys Wreck R. R. Trains 47
Mortar, Mixing 215
Mortars 167
Motor, New Compressed-air 56
Motor, The Mekarski, for Street-cars 103
Municipal Engineering 264, 342

N.

Natural Gas for Glass Making 344
Natural Gas, Warren Co., Pa 269
Navigable Stream, What Constitutes a 286
Navy Yards, European 292
N. E. & Southern Construction Co 62
New Croton Aqueduct, 61, 287, 302, 315, ... 328, 367, 394
New Ordnance Material, 216, 242, 257, 274, ... 292, 310, 322, 339, 354, 369, 385, 401
New Zealand Parliament 404
News from Many Lands 397
Newspaper Law 246
Niagara, Recession of 182
Nitro-Gelatine 151
Nordenfelt Submarine Boat 257

O.

Observatory, The Lick 169
Odometer, The 59
Ohio River and its Tributaries 329
Oil Pipe Line, A New 414
Old Weights and Measures, Why the English Cling to 91
Ordnance, Bethlehem Iron Works to Make 166
Ordnance Commission 303
Ordnance Material, New, 216, 242, 257, 274, ... 292, 310, 322, 339, 354, 369 385 401
Ordnance, Report of Chief of 308

P.

Pacific Ocean Water in Nevada 238
Paper, Famous 166
Pavement, A New 234
Pavement Kerr in St. Paul 15
Pavements in New York, Cost of 184
Pavements, Here and Abroad 186
Paving, Philadelphia 376
Paving, Sioux City, Ia 397
Paving Block, A New 336
Paving Material, Cedar 257
Permanent Way Inspectors 203

Personals.

ABBOTT, Samuel 201
Abercrombie, F. P 345
Ackenheil, Chas 362
Anderson, Gen. Adna 121

BABCOCK, D. S 136
Babcock, S. E 251
Bandcrally, D 202
Barrington, W. E 186
Beach, G. M 187, 251
Belknap Geo. E 330
Bent, Cornelius C. I 410
Bontecou, Daniel 266
Boody, Azariah 330
Boquet, Jean Claude 201
Bradstreet, Albion G 41
Brewer, Frank 26
Brokaw, Isaac 410
Brown, C. D 410
Bushnell, J. W 410

CECIL-SACKVILLE, Lord 121
Chanute, Octave 171
Chaplin, W. S 26
Cleaveland, F. A 11
Clements, Wm. M 91
Colton, Chauncey S 73
Cooper, Wm. H 251
Couche, M 201
Crafts, N. Henry 186

DARLINGTON, F. G 345
Darrow, Jas. H 395
Datesman, G. E 345
Davidson, Thomas 266
Davis, Lorenzo M 282
De Kantzow, W 136
De Kinder, Jos. J 266
De Lesseps, F 346
Donohue, Peter 362
Dorsey, E. B 186
Douglas, Wm. M 299
Drake, N. A 266
Draper, Prof. John C 411
Dunn, John 136
Durand, Thos. C 234

EADS, James B 153
Elmer, H. W 330
Evans, Rich'd J 26

FICKINGER, J. A 171
Fisher, Chas. H 362, 410
Flagg, J. Foster 218
Fleming, Sandford 362
Fraisse, Wm 171
Frith, John 171

GAYS, W. H 26
Gellette, W. D 266
Gilbert, Dr. Rufus H 41
Gillham, Robert 153
Goodrich, A. E 186
Gorman, Chas. D 121
Gorringe, Henry H 26
Gottlieb & Co 202
Gould, Jay 362
Grant, John 26
Greely, Lieut 105
Green, Benj. H 251
Greene, Capt. F. V 73
Greenwood, Miles 313
Guild, Wm. H 330

HALE, Horace J 410
Hall, Wm. H 395
Hammond, R. P. Jr 346
Hazen, Gen. W. B 91
Helm, George 330
Hilgard, Prof. J. E 121
Hinckley, F. L 345
Hines, D. S 346
Holden, Ed. S 313
Howell, Courtland D 136, 153
Hutin N 218

IRWIN, Thos 121
Irwin, W. C 187

JERVIS, John B 368
Johnson, Geo. J 171

KERRIGAN, Wm 202
Knight, W. B 171

LATCHA, J. A 234
Latimer, F. H 345
Leonard, F. M 380
Lewis, Nelson P 282
Linderman, Dr. G. B 218
Lorenz, Wm 186
Lyman, Azel S 136, 153

MARTIN, Artemus 201
Motz George 410
McClellan, Geo. B 282
McCrea, James 186
McDuffie, J. A 26
McGillivray, Ed 362
McKee, Chas. H 282
McVean, G. G 313
Merrill, Geo. P 91
Mifflin, Samuel W 73, 105
Miller, Ezra 41
Miller, Harry I 73
Miller, J 91
Modjeska, Ralph 410
Morison, Geo. S 105
Morrel, D. J 136
Morris, Robert E 218
Morris, Thos. B 330
Myers, E. E 201

NELL, Capt 73
Neven, R. J 362

O'BRIEN, J. F 121, 186

PARRISH, Fred. B 171
Parsons, Wm. B. Jr 266
Patton, Col. Wm. M 105
Peary, R. E 170
Pettibone W. H 91
Pierce, Dwight. E 171
Pierce, Thos. W 233
Pomeroy, R. M 345
Pratt, Calvin 331, 410
Priest, Zenas C 234
Prime, Peter 345

RANDOLPH, Epes 105
Reed, H. G. H 233
Rice, Reuben N 26
Rhinelander, F. W 202
Roberts, Percival, Jr 282
Roosevelt, R. B 266
Rouser, I. H 345
Rummele, E. H 202
Russell, H. S 345

SHAUGHNESSAY, T. G 170
Shelford, Wm 201
Shiply, John S 121
Siebert, Selmar 233
Sites, W. W. C 233
Slocum, Chas. M 186
Smith, Andrew 330
Smith, Gen. Wm. Sooy—& Son 105
Smith, Himes W 91
Smith, Hon. D. A 362
Snow, E. M 233
Speed, J. G 345
Spradlin, W. H 330
Stearns, Irving A 26
Stephen, Geo 362
Stephens, Nathan 153
Strangham, Jas. C 330
Straughan, J. R 362
Strobel, C. L 266
Swift, A. J 266

TALCOTT, G. R 201
Talcott, R. H 91
Taylor, Matt 234
Thomas, E. B 187, 233
Thompson, C. W. T 266
Thurston, Robert H 73
Townsend, Peter 218
Tozalin, A. E 121

UNRUH, Frank 410

VANDERBILT, Wm. H 380
Voorhees, Theo 233
Von Reigenstein, L 136

WALKER, Frank A 26
Wallace, W. M 26
Walters, Geo 345
Waterbury, Chas. G 26
Watson, Peter H 73
Wattles, J. S 330
Webster, Chas. E 299
Wernwag, Lewis the Bridge Builder 99
Whitcomb, H. L 202
Whittey, J. Robinson 186
Wiley, W. H 121
Williams, Wm. J 313
Wilson Bros 56
Wood, J. G 345
Wood, Wm 234
Wright, I. W 170

YOLLAND, Wm 171
Young, Coe F 91
Young, H. A 345

Philadelphia's New Charter 23
Pipe Line, A New 333
Pipe Line, Russian 287
Pipe Lines in the Caucasus 73
Plaster, Hardening 90
Pneumatic Postal Service, Paris 48
Poetsch Method, Shaft Sinking 24
Polytechnic Institute, Rensselaer 410
Population, New Jersey Towns 111
Post Office Rules, New 11
Powder, Forcite 89
Progress by Short Cuts 104
Propeller Sluicing 410
Print Process on White Ground 343
Public Buildings 71

Publi Work. St. Paul, Minn 31
Public Works. Brooklyn, N. Y 88
Canadian 77
Chicago, Ill 88
Nashville, Tenn 78
New York 104
New York Dept. of 75
N. Y. Dept., Report 329

Pump. Hall Duplex 247
Hannibal, Mo 142
Wilmington, Del 253
Pumping Engines, Hannibal, Mo 333
Pumping Engines, Mare Isl., Cal 349
Pumping Engines, Worthington 300

Pumps. Cameron Steam 221
Chicago, N. S. Works 253
Columbus, Ohio 237
Dean Brothers 87
Deane 135
Lawrence Machine Co 119
Purification, Self-, of Natural Waters 407
Pyramid, Petrie on the 165

Q.

Quaker Bridge Dam 315
Quaker Bridge Dam, Congressman Potter vs 360

R.

Rail Equipment of the Future 127
Rail Fastening, New Method 62

Railroad. A Chinese 351
Adirondack 223
A Long 383
A New—in China 143
Annapolis Short Line 192
Anniston and Atlantic 79
Another Mexican 94
Another Transcontinental 334
Aransas Pass 62
Arkansas Valley 384
Arizona Central 79
Asheville & Spartanburg 62
Atlantic & Great Western 335
Atlantic & Pacific 157
Balt. & Ohio 62, 158, 383
B. & O. Reaches N. Y 351
B. & O., Surveys for 382
B. & O. To Enter New York 303
Beach Crk. Clearfield & S 94
Black Hills 15
Black River Falls, Lumber & Iron 383
Bolan Pass 303, 351
Bought, Chester Co 383
Bridges, Dangerous 376
Bridges, Iron Sustructure for 373
Bridges in New York State 110
Brooklyn Underground 367
Brooklyn Elevated 334
Building 367
Building, Competitive 58
Building in Mexico 89
Building, Prospects of 314
Burlington & Missouri 79, 94
Canadian Pacific 79, 111, 207
Carbondale & Paducah 223
Central Asiatic 94
Central Missouri 400
Central Pacific 255
Chesapeake & Nashville 47, 62, 94, 287, 382
Chicago & Northwest 94
Chicago & Western 158
Chicago, Burl. & Northern 158
C., P. & Q 383
Chicago, Freeport & St. Paul 303
Chicago, Milwaukee & St. Paul 94
C., R. I. & St. Joseph 15
Chicago, Wis. & Northern 79
Cin., Hamilton & Dayton 15
Cin. Northern 15
Clarendon & Pittsford 207
Coney Valley 206
Congo 158
Conn. Air Line 352
Connotton Valley 15
Construction in Kansas 384
Contract 399
Contractors, Suits Against 384
Covington & Macon 63
Crookston & Minneapolis 15
Dallas & Wichita 191
Dangers on India 15
Decorah, Rochester & Red River 62
Denver & N. O 142
Duluth & Northern 158
Denver & Rio Grande 174
Denver, Memphis & Atlantic 110, 158
Denver, Western & Pacific 158
Dubuque & N. W 110
Duluth & Winnipeg 79
East Broad Top 254
E. Tenn., Va. & Georgia 158
Extending Penna. South 31
Fargo, Moorhead & N. W 142, 158
Fargo Southern 15
Fast Time on B. & O 31
First in America 124
Florida Southern 127
Freights 23
Fremont, Elkhorn & Mis 157
Gauges in U. S 63
Guatemalan 31
Golden Belt & Gulf 61
Gulf Short Line & St. Louis 175
Hastings, Neb. Street 383
Hoboken's Elevated 415
Hudson River & Boston 79
Hutchinson, Glencoe & Southern 383
Illinois Central 223
Illinois Midland 61
Indianapolis & Evansville 317
James River Valley 334
Jeffersonville & Terre Haute 287
Kansas City Suburban 31
Kansas, Nebraska & Dakota 126, 271
Kentucky 383
King's Co. Elev 350
Kingwood 79
La Crosse & Black River 158
Lafayette, N. & Wabash 158
Lake Mich. & Ohio 287
Leavenworth, N. & S 303
Lebanon & Nashville 61
Legislation in England 74
Lookout Mt 157
Manitoba Western 174
Maricopa & Phœnix 303
Marshall & N. W 287
Memphis & Charleston 330

Memphis, Birmingham & Atlantic..... 384
Memphis, Oxford & Col..... 157
Mexican National..... 31, 62, 384
Mexico & Tuxpan..... 207
Mileage in Ohio..... 31
Milwaukee, Lake Shore & W..... 31
Mineral Range..... 287
Min. & N. West. Finished..... 63
Mission Ridge..... 350, 382
Missouri Pacific..... 79, 207
Montreal & European..... 32
Mt. Kearsarge..... 158, 318
Mt. Lookout..... 63
Mt. Pleasant & Sea View..... 382
New..... 383
New Alpine..... 335
Newport, R. I., St..... 335
N. Y. & Boston Inland..... 317
N. Y. & Council Bluffs..... 223
N. Y. & Ridgefield..... 79
N. Y. Central..... 95
N. Y. Susquehanna & Western..... 62
Norfolk & Western..... 350
N. & W. (N. B.)..... 207
North shore..... 62
Northern Pacific..... 207
N. Pacific Coast..... 303
Northern Pacific Extension..... 47
N. W. Central Co..... 62
Oakland & Colby..... 382
Of Cin. First..... 383
Ohio Central..... 287
Ohio Valley..... 254, 335
Omaha, Abilene & Wichita..... 62
Orleans, Paoli & Gasper..... 61
Painesville & Yorktown..... 62
Painsville & Youngstown..... 15
Phila. & West Chester..... 31
Pickering Valley..... 383
Pike's Peak..... 110
Pine Creek..... 350
Pocahontas & Hoxie..... 207
Prospects..... 352
Prov., Warren & Bristol..... 157
Reading & Pottsville..... 318
Relocating Midlands..... 207
Rock Island Extension..... 47, 79
Rome & Carrollton..... 62
St. Bernard..... 175
St. Joseph's Valley..... 174
St. Louis & Kansas City Short Line..... 31
St. Louis, Carbondale, etc..... 335
Saratoga & Almaden..... 223
Savannah, Dublin & Western..... 334, 392
Saugatuck Valley..... 158
Schuylkill East Side..... 126
Sensation, N. G..... 383
Sioux City & Pacific..... 94
South Penna..... 31, 110, 188, 192, 303, 396
South Penna, Syndicate..... 95
Southern Pacific..... 15
Suakim—Berber..... 114
Texas, Santa Fe & North..... 32
The Short Line..... 174
The "Williams."..... 79
Toledo, Ann Arbor & N. Mich..... 15
Toledo, Columbus & Southern..... 15, 94
Topeka, Frankfort & Marysville..... 352
Trains, Future Speed of..... 49
Trans-Andean..... 224
Underground for Chicago..... 31
Underground for Paris..... 31, 61
Union Pacific Extension..... 62
Vicksburg & Meridian..... 110
West Shore..... 399
Wisconsin Central..... 47, 62, 127, 157
Wisconsin, New..... 368
Wyandotte & N. W..... 368
Youngstown & State Line..... 334

Railroads. American & Foreign..... 159
Argentine..... 63, 351
Assessing in N. C..... 62
Belgian..... 32, 63
British India..... 174
Built in 1885..... 63
Built with Profit..... 143
Canadian..... 159
Canadian Pacific..... 15
Central American..... 302
Chili..... 15
Chinese..... 175
Colombia..... 158
Electric..... 166
English..... 255
English, in India..... 312
French..... 94
German..... 94
In Alabama..... 143
In China..... 315, 331
In Italy..... 218
Illinois..... 110
Indiana..... 79
In Japan & China..... 250
In Palestine..... 110
In Tennessee..... 352
In the south..... 348
Japan..... 15
Kansas..... 367
Mexican..... 40, 62
Nebraska..... 367
New South Wales..... 15
Oregon..... 47
Poor's Manual of, for 1884..... 94
Rack, Abt System..... 406
South Carolina..... 335
Strategic..... 143
Swiss..... 379
Swedish..... 255
Street—in Eastern States..... 302
Unbuilt in Georgia..... 191
Rail-Testing in Russia..... 342
Rails, Apparatus for Washing..... 348
Rails, Double..... 240
Rails, English vs. American..... 392
Rails, Price of Steel..... 302
Rails, Steel..... 122
Rails, 25,000 ton Contract..... 47
Rails, Weight and Section of..... 295

Railway. A Balloon..... 110
Concession to Eads Ship..... 399
Construction, 1830-84..... 127
Corps, Prussian..... 39
Development, In Norway and Sweden 415
Dividends in Europe..... 95
Eads Ship..... 399
Employes in Penna..... 106
Engines Export from U. S..... 215
Metropolitan—of Paris..... 108
Mortality in New York..... 79
Paris Metropolitan..... 121
Situation in Mexico..... 86
Speed, Fastest..... 122
System, German..... 57
The Transvaal..... 110
Time Chart..... 248
Travel, Safety of..... 215

Railways at Cape of Good Hope..... 288
Chinese..... 390
How Built (Ed.)..... 72
In Japan..... 81
Rainfall, Croton Water-shed..... 46
Rainfall, What 5¾ in. Mean..... 110
Rapid Transit, Suburban..... 379
Refuse Destructor, Bee-hive..... 133
Refuse Removal, Domestic..... 247
Reminiscences of Construction of the N. Y., W. S. & B. R. R..... 356
Report of the Sec. of War, Annual..... 393
Reporter or Lecturer?..... 360
Reservoir, Fisher Hill, Boston..... 233
Reservoir System on Mississippi..... 217
Reservoirs, The Mississippi..... 205
Review for Engineers, A Quarterly..... 411
Rifle vs. the Bow..... 88
Riker's Island, Proposed Enlargement of, 408
River Physics, Three Problems in..... 68
Rivers and Harbors, New Jersey..... 416
Rivers and Harbors of California..... 95
Road Grading, Cost of..... 271
Road Making and Repairing..... 314
Roadways and Streets, Private, in England..... 407
Rock Drills at the Inventions Exhibition, English..... 373
Rock Removing, Under Water..... 17

S.

St. Paul Minn, Growth of..... 232
Sand-bag Embankments..... 265
Sand, Flow of Water Through..... 265
Sanitary Ordinances, Suggestions for..... 197
Saratoga, Iron in the Springs..... 238
Screws, Minute..... 343
Sea Level, Change of at Kurile Islands..... 112

Sewer. Buffalo, N. Y..... 349
Sewer Building, New Method of..... 399
Lake, Ills..... 398
Newport, R. I..... 398
Sewer Connections, Durham System..... 268
Sewer, Lynn, Mass..... 142
Sewer, Newark, N. J..... 205

Sewers and Death-rate in Chicago..... 89, 165
Boston..... 126
Des Moines, Ia..... 382
Mass., State..... 157
Minneapolis..... 415
of San Francisco..... 217
Worcester, Mass..... 156

Sewage. Destructor, Leeds, etc..... 31
Disposal..... 234
Disposal, London..... 401
Disposal of Berlin..... 241
Disposal, Providence..... 209
Disposal, Salisbury, Eng..... 173
Notes on..... 100
of Paris..... 46
Precipitation..... 254
Quantity of London..... 237
Utilization of, by Paris..... 298
Value of London..... 142

Sewerage. Athol, Mass..... 317
Boston, Mass..... 156
Brockton, Mass..... 125, 156
Coney Island..... 254, 366
East Orange, N. J..... 172
Lennox, Mass..... 366
Madison, Wis..... 256
Merthyr Tydvil..... 173
Omaha, Neb..... 381
Orange, N. J..... 349
Pullman, Ill..... 333
Shone System in Sacramento..... 221
S. Framingham, Mass..... 205
Stamford, Conn..... 381
Westboro, Mass..... 156
Wallingford, Conn..... 269
Worcester, Mass..... 205
Shaft, Sinking a Coal..... 97
Shaft-Sinking by Freezing..... 24
Shaft, The 3,000 feet Comstock..... 137
Shall England Build our War Ships?..... 297
Ship Building on the Clyde..... 395
Contract..... 399
Ship Building, England..... 197
Ship Building, Profits of, etc..... 312
Ship Canal, Manchester..... 93, 280
Ship Canal, Volga to Don..... 393
Ship Railway, Chignecto..... 192
Ship Railway, New Brunswick..... 143
Sidewalks, Concrete, in Providence, R. I. 301
Sleepers, Steel, in Belgium..... 415
Soldiers Home..... 415
Slag, Utilization of..... 321
Sounding in Pipes by Metallic Potassium..... 170
South America..... 193
Spark Arresters..... 23
Stables, Air-space in..... 87
Stand Pipe, Lexington, Mo..... 285
Stand-Pipes, Brick-Encased..... 413
Stand Pipes, Tall..... 374
Statue of "Liberty," Cost of..... 170
Steamboats, Fast..... 414

Steel and Iron Exports, British..... 15
Castings..... 45, 151
for Ship Building..... 164
French Treatment of..... 284
Improvement in..... 350
Industry, Our..... 57
Ties in Belgium..... 191, 317
Steps, Length of..... 54
Stone, Compressive Strength of..... 246
Stone, Decay of..... 165
Stove, The Russian..... 112
Street-car Motor, The Mekarski..... 105
Strength of Granite..... 387

Street Cleaning and Maintenance..... 75
Cleaning in New York..... 409
Paving in Philadelphia..... 168, 271
Railway, Albany, N. Y..... 206
Railways, Construction of..... 261
Sweeping, Cost in St. Paul..... 161
Substructure for R. R. Bridges, Iron..... 373
Suburban Rapid Transit..... 379
Survey, The National..... 33
Survey, U. S. Top. in Tenn..... 63
Surveying Instruments..... 284
Surveying, Local Attraction in Land..... 277
Surveys, Defective, in Idaho..... 126
Switch, The Horseshoe..... 39

T.

Tay Viaduct..... 283
Technical Apparatus, Japanese..... 59
Telegraph, Long Span..... 272
Telegraph Statistics, West. Un..... 400
Telegraphing, Rapid..... 327
Temperature, Interior of Earth..... 118
Temperatures, Underground..... 386
Testing Water for Organic Life by the Gelatine Method..... 410
Tests of Cement..... 388
Inflammability of..... 390
Thames, The Purification of..... 103
The Treatment of Sediment Bearing Streams, etc..... 269
Tile Making, etc..... 368

Timber. Exports of..... 140
Preservation of..... 19
Toughening..... 90
Topography of Machines..... 83, 123
Topographical Maps, Making Conventional Signs on..... 358
Torpedo, A New..... 244
Torpedo Boats, New..... 239
Town Plats, Recording, in Mich..... 29
Track, 12, 28, 44, 60, 76, 92, 108, 124, 140, 154, 172, 188, 202, 219, 234, 251
Traffic, Daily, on Broadway, N. Y..... 17
Train Walkers, Checking..... 159
Trains 586, per Day..... 47
Trains, Long Freight..... 394
Tramways, English..... 94
Transit, Suburban Rapid..... 379
Travel in New York..... 344
Travellers, Rights and Risks of..... 55
Trinidad Pitch..... 112
Triangle with Given Sides, to find Angles..... 171
True Meridian, To Determine a..... 375

Tunnel. An Ancient in Sicily..... 318
and Mining Plant..... 223
Dubuque..... 61
Fastest Driving of..... 159
Gimplow..... 268
Kittatinny..... 191
Lighting Hoosac..... 126
Ninth St., Chattanooga..... 63, 95
Phœnixville, Pa..... 209
Pinkerton..... 31
Port Huron..... 207
Prince Edward Island..... 205, 291
Proposed Thames..... 136
St. Bernard..... 302
St. Clair River..... 174
St. Gothard Contract..... 29
Severn..... 174, 223
Washington, D. C..... 125, 270
Tunnels, South Penn. 208, 239, 306, 325, 328, 339, 344, 371
Twenty Four O'Clock..... 374

U.

Unarmored Cruisers for the U. S..... 267
Underground R. R. Broadway..... 158
Underground R. R's., New York..... 158
Underground Temperatures..... 386
Underground Wire Com. of N. Y..... 61
Underground Wires in Brooklyn..... 47
Underground Wires, Testing..... 107
U. S. Eng's. Annual Report..... 347
U. S. Geol. Survey, Report..... 347

V.

Velocity, Measurement of, in Ocean Currents..... 309
Ventilation of Buildings, Air Required in the..... 411
Viaduct, Omaha..... 222
"Volapuk," The, Language..... 90

W.

Wages in Europe..... 320
Wages in 1697..... 242
Wages in Sixteenth Century..... 215
Walls, Absorbency of..... 182
War Ships? Shall England Build Our..... 72
Washington Monument, Protecting from Lightning..... 311
Waste-water Meter, The Deacon..... 168

Water. An Inch of..... 30
Analysis of Phila..... 46
and Sewerage as a Preventor of Typhoid..... 122
Benefits of Boiling..... 189
Chemical Analysis of London..... 130
Closet, First Trapped..... 382
Co. South Mt. Pa..... 253, 269
Co. The Metropolitan..... 24
Consumption, German Rules for..... 282
Contaminated..... 274
Drinker's Dream..... 175
Extension, Brooklyn..... 361
From Below Sea Level..... 205
Gauging of Flowing..... 100
In New Wood..... 317
In the Deserts of Tunis..... 110
Jet, Sinking Piles by..... 33
Mains, Cleaning, by Chemicals..... 173
Pollution of Nyack, N. Y..... 398
Power Measurement..... 349
Power Co., Wilmington, Ill..... 204
Purified by Iron..... 147
Rates in U. S..... 187
Tower, Swampscott, Mass..... 333
Utica, N. Y..... 206
Water-meter, The McCullum..... 174
Water-meters in Jersey City..... 269
Water-meters, Trial in Germany..... 284
Water-pipe Assessments..... 238
Water-pipe, Shocks in..... 204
Water-pipes, Galvanized Iron..... 209
Water-pipes, Glasgow Specifications..... 246
"Waterstaat" of Holland..... 120

Water Supply. Boston High Service..... 187
Amsterdam..... 170
Boston, Mass..... 190
Brooklyn..... 173, 204
by Meter..... 182
Chicago..... 300, 317
Future, of Phila..... 24
Paris..... 190
Sudbury..... 174
Venice..... 308
Waterways Convention, The..... 167
Waterways, Improvement of..... 412
Waters of Utah, Strange..... 93

Water Works, Abelene, Tex..... 189, 253, 316
Adrian, Mich..... 414
Adams, N. Y..... 204
Albany, N. Y..... 381
Anaconda, Mont..... 286
Anderson, Ind..... 270
Ann Arbor, Mich..... 381, 398
Arkansas City, Kan..... 204
Ashland, Neb..... 285
Ashland, Pa..... 61, 109
Aspen, Cal..... 14, 46
Austen, Tex..... 172
Bainbridge, Ga..... 61
Baltimore, Md..... 30, 61
Barrington, L. I..... 366
Batavia, N. Y..... 189
Bayfield, Wis..... 316
Bayonne, N. J..... 315
Beatrice, Neb..... 398
Bedford, Pa..... 365
Belfast, Me..... 285
Belleville, Ill..... 30, 254
Beloit, Wis..... 270, 300
Bennett, Neb..... 190
Bennington, Vt..... 156
Beverly, Mass..... 189
Beds, Detroit..... 398
Big Rapids, Mich..... 269
Binghamton, N. Y..... 316
Birmingham, Ala..... 46, 316
Bismarck, Dak..... 126, 156
Blair, Neb..... 93, 397
Bonds, N. Y..... 398
Bonds, Schenectady, N. Y..... 333
Boston, An. Report..... 232
Brentham, Tex..... 189
Bristal, Tenn..... 204
Brooklyn, Extension..... 334
Brunswick, Ga..... 78, 93, 205
Butler, Mo..... 397
Cambridge, Mass..... 189, 381
Cambridge, N. Y..... 189
Canastota, N. Y..... 204, 414
Carrollton, Mo..... 270
Charleston, W. Va..... 332
Charlotte, Mich..... 156, 189
Chattanooga..... 381
Chicago, Ill..... 93, 156
Chippewa Falls, Wis..... 285
Clinton, Mo..... 253
Cohoes, N. Y..... 286
Colorado, Texas..... 237
Colton, Cal..... 173
Co. Long Island..... 269
Co. Metropolitan, Ia..... 365
Co. Pond..... 238
Co. Tampa..... 365
Cornelsville, Pa..... 365
Covington, Va..... 397
Crawfordsville, Ind..... 189, 270, 300
Cleveland, O..... 46, 110, 190
Deposit, N. Y..... 142
Des Moines..... 173
Dubuque, Ia..... 93
Eagle Rock, Idaho..... 190
East Dallas, Tex..... 172
East Glasgow, N. S..... 398
E. Greenwich, Long Island..... 253
Eau Claire, Wis..... 30, 109
El Dorado, Kan..... 300
Ellsworth, Kan..... 172
El Paso, N. M..... 172
Engine Test of Buffalo, Holly..... 398
Fairmount, Neb..... 61
Farnham, Quebec..... 204
Fond du Lac..... 78, 93
Fort Gratiot, Mich..... 30
Fort Madison, Ia..... 221
Fort Plain, N. Y..... 253
Fortress Monroe, Va..... 78
Frankfort, Ky..... 270
Fremont, Neb..... 142, 172, 189
Gadsden, Fla..... 270
Galatin, Tenn..... 349
Galesburg, Ill..... 414
Gardiner, Me..... 142, 349
Goldboro, N. C..... 365
Grand Island, Neb..... 108, 221, 253
Granville, N. Y..... 221, 365
Guanajuato, Mex..... 173
Hanover, Pa..... 365
Harper, Kan..... 365
Harrisville, R. I..... 414
Hastings, Neb..... 173
Hillsborough, Ill..... 332
Hillsdale, Mich..... 205
Hingham, Mass..... 300
Halbrook, Mass..... 221
Homer, N. Y..... 300
Houlton, Me..... 125, 227
Houston, Texas..... 253
Huntingdon, Pa..... 254, 269
Hyde Park, Ill..... 109, 221, 398, 398
Iroquois, Canada..... 221, 349
Jacksonville, Fla..... 61
Janesville, Wis..... 365
Jersey City..... 381
Kankakee, Ill..... 349
Kingston, Mass..... 300
Lachine..... 397
Lake Village, N. H..... 285
Larned, Kan..... 382
Leechburgh, Pa..... 204
Lincoln, Ill..... 382
Lincoln, Neb..... 125
Little Falls, N. Y..... 156
Liverpool..... 214
Locust Mount, Pa..... 221
Lowell, Mass..... 237
Madison, N. J..... 173
Madison, N. Y..... 156
Mankota, Minn..... 204
Marshall, Mo..... 300
Mason City, Ia..... 30
Mattoon, Ill..... 204, 361, 414
Melrose, Mass..... 204
Menomonie, Wis..... 14, 108
Middleboro, Mass..... 142, 156, 253, 394
Milwaukee, Wis..... 333, 398
Minerva, O..... 397
Minneapolis, Minn..... 156, 285
Mitchell, Dak..... 381

Mexico City 189, 228
Mexico, Mo 125
Moberly, Mo 285
Mont Clair, N. J 263
Montgomery, Ala 265
Montreal, Can 78
Morgan Supply Co 14
Morrison, Col 262
Muncie, Ind 205, 300
Muscatine, Io 232
Nashville, Tenn 46
Neillsville, Wis 333
Newark, N. J 189
Newark, O 189
New London, Conn 205
New Rochelle, N. Y 73
North Attleboro, Mass 109
Norfolk, Va 397
Norwalk, Conn 156
Oceanside, Cal 295
Orwigsburg, Pa 46
Ottawa, Kan 295
Owatonna, Minn 221
Palermo, Sicily 174
Palmer, Mass 253, 285
Paola, Kansas 295
Pensacola, Fla 315
Philadelphia 93, 217
Phillipsburg, N. J 204
Phœnix, R. I 189
Pierre, Dak 172
Pittsfield, Mass 349
Plattsmouth, Neb 93, 172
Pontiac, Mich 172, 221
Prairie Grove, Ark 110
Pub. Buildings, Phila 61
Racine, Wis 316, 349
Red Bank, N. J 61, 131
Red Cliff, Col 189
Red Wing, Minn 46
Reports, Uniformity in 200
Richfield Springs, N. J 285
Rochester, N. H 142
Rochester, Minn 125
Rockford, Ill 156
Rockland, Me 300, 349
St. Clair, Mich 300
Savanna, Ill 209
Schenectady, N. Y 237
Scranton, Pa 179
Selings Grove, Pa 172
Seville, Ind 305
Shelbyville, Pa 204
Shippensburg, Pa 125
Sing Sing, N. Y 316, 349, 398
Smyrna, Del 78
So. Abington, Mass 156
So. Bethlehem, Pa 238
South Pueblo, Col 93
Sterling, Neb 249
Stoughton, Wis 221
Syracuse, N. Y 189
Talladega, Ala 237
Tallahassee, Fla 109
Tampa Fla 30
Tarentum, Pa 316
Tallorsville, Ill 332, 349
Tarrytown, N. Y 398
Texarkana, Tex 300, 333
Toronto, Can 14, 30
Trenton, Mo 397
Utica, N. Y 266, 305
Valley Falls, N. Y 204
Vineland, N. J 398
Wabash, Ind 349, 374
Wahpeton, Dak 269
Warren, O 397
Warsaw, Ind 156
Warsaw, N. Y 172
Washington, D. C 125
Waterloo, Iowa 285
Waterloo, N. Y 189
Watertown, Wis 46
Wausau, Wis 334
Wellsburg, W. Va 61, 156, 173
Wellesley, Mass 225
Wellsboro, Pa 315
Wenonah, N. J 315
West Lincoln, Neb 286
West Point, Neb 315
Weymouth, Mass 142, 286, 381
Williamsport, Pa 156
Willimantic, Conn 125
Woodbury, N J 173, 204
Woodville, N. H 300

Water Works.—History and Statistics of American.

Cochituate 221
Greenville, Ill 285
Red Oak, Ia 30
Reinbeck, Ia 30
Rockville, Conn 46
Rutland, Vt 46
St. Anthony's Falls 61
Salida, Colo 77
San Luis Obispo, Cal 77
Shamokin, Pa 108
Shelton, Conn 108
Silver Cliffs, Cal 124
Sioux Falls, Dak 124
So. Abington, Mass 125
So. Evanston, Ill 125
Southington, Conn 155
Springfield, Me 155
Springfield, Mo 155
Swampscott, Mass 285
Sunbury, Pa 158
Terrel, Tex 26
Tidioute, Pa 203
Uxbridge, Mass 203
Uxbridge, Ontario 203
Wadsworth, Ohio 220
Webster City, Ia 220
Wellsville, N. Y 220
Westchester Protectory, N. Y 247
Whitehall, N. Y 237
Williamstown, Mass 237
Winfield, Kansas 268
Winston, N. C 285
Woodstock, N. B 285

Well Artesian. Albany, Ga 316
Altoona, Dak 253
Americus, Ga 270, 315
Atlanta, Ga 253, 286, 397
Brick Church, N. J 237
Charleston, S. C 204
Cohasset, Mass 316
Columbia, Dak 172
Demopolis, Ala 285
Denver, Col 349
Eastman, Ga 349
Ellendale, Minn 397
in Moscow 142
Jefferson, Ill 253
Hope, Ark 270
Huntington, W. Va 316
Lincoln, Neb 349
Loveland, Col 156, 253
New Orleans, La 365
Northampton, Mass 204
Ocean Grove, N. J 221
Remarkable, at Tunis 300
Reynolds, Ga 332
St. Helena, Neb 253
Seaconnet, R. I 414
Scotland, Dak 315
Springfield, O 333
White Plains, Neb 109
Yamacraw, Ga 349
Well, Greatest Gas 204

Wells Artesian. 396
Asbury Park, N. J 269
in Sahara 125
in the South 316
Name of 119
New Orleans 20
Notes on 50, 82
3000 in Colorado 315
Driven at Hyde Park 142
Driven—Flushing 172
in Sandy Soil 281
Weak Business Men 38
Weather Record Milwaukee 73
Weights and Measures. Why English Cling to Old 153
Whitewash on the Capital 139, 171
Windmills for Water Supply 353
Wind Pressure 65
Wind Pressure, Maximum 234
Wire Works, Barnum 384
Wood Charred by Steam Pipes 202
Wood Pavement, A New 156
Wood Preserved by Guttapercha 111
Wood Preserving Processes 45
Woods, American 21